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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(40)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 100/01189	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/IL99/00525	International filing date (day/month/year) 04 OCTOBER 1999	Priority date (day/month/year) 02 OCTOBER 1998
International Patent Classification (IPC) or national classification and IPC IPC(7): H04L 069/00 and US Cl.: 705/65		
Applicant COMSENSE TECHNOLOGIES, LTD.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 8 sheets.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority. (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of report with regard to novelty, inventive step or industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 27 APRIL 2000	Date of completion of this report 10 JANUARY 2001
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer VINCENT MILLIN <i>James R. Matthews</i> Telephone No. (703) 308-1065

I. Basis of the report**1. With regard to the elements of the international application:***

- ☐ the international application as originally filed
- ☒ the description
pages (See Attached) _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☒ the claims
pages (See Attached) _____, as originally filed
pages _____ as amended (together with any statement) under Article 19
pages _____ filed with the demand
pages _____, filed with the letter of _____
- ☒ the drawings
pages (See Attached) _____, as originally filed
pages _____ filed with the demand
pages _____, filed with the letter of _____
- ☒ the sequence listing part of the
description (See Attached) _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2 With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item
These elements were available or furnished to this Authority in the following language _____ which is

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b))
- ☐ the language of publication of the international application (under Rule 48.3(b))
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3)

3 With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international

- ☐ contained in the international application in printed form
- ☐ filed together with the international application in computer readable form
- ☐ furnished subsequently to this Authority in written form
- ☐ furnished subsequently to this Authority in computer readable form
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

4 ☒ The amendments have resulted in the cancellation of

- ☒ the description, pages **NONE**
- ☒ the claims, Nos **NONE**
- ☒ the drawings, sheets/fig **NONE**

5 ☐ This report has been drawn as if (some of) the amendments had not been made since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c))

** Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

***Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

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International application No.

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. statement**

Novelty (N)	Claims	(Please See supplemental sheet)	YES
	Claims	(Please See supplemental sheet)	NO
Inventive Step (IS)	Claims	(Please See supplemental sheet)	YES
	Claims	(Please See supplemental sheet)	NO
Industrial Applicability (IA)	Claims	(Please See supplemental sheet)	YES
	Claims	(Please See supplemental sheet)	NO

2. citations and explanations (Rule 70.7)

Claims 1-29 lack an inventive step under PCT Article 33(3) as being obvious over Allen et al(US Pat. No: 5,815,020).

As per claim 1 Allen discloses a smart card comprising a memory for storing information; at least one transmitting or receiving antenna, and a low frequency circuit for handling information associated with said antenna and memory(Fig 2).Allen does not disclose that the information is modulated at a modulation frequency of between 5Khz and 100khz. However, since the modulation frequency is in the low frequency regime this is an obvious design application.

As per claims 2-7, 23 and 26-27 the limitations recited are obvious antenna design variations. With respect to Applicant's comments on claims 6 and 23, replacement of a coupling coil with an acoustic antenna is an extension of the field radiation principle and is a quasi-equivalent formulation.

As per claim 8, Allen discloses a processor for processing information(Fig 2).

As per claim 9, Allen discloses that the processor generates a response to an interrogation of the smart card(Fig 2).

As per claim 10-11, Allen discloses that the memory comprises a long-term memory and a temporary memory(Fig 2).

As per claims 12-22, 24, and 25 the limitations recited are obvious modulation frequency variations. With respect to Applicant's position on claim 18, Allen discloses the smart card with a low frequency circuit. The specified modulation frequency is 21 Khz which is indeed in the low frequency regime.

As per claim 28 Allen discloses that the smart card requires a two-way communication protocol.

As per claim 29, the limitation of an error correction protocol would have been obvious to increase the throughput of the system.
(Continued on Supplemental Sheet.)

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

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I. BASIS OF REPORT:

This report has been drawn on the basis of the description,
page(s) 1-53, as originally filed.
page(s) NONE, filed with the demand.
and additional amendments:
NONE

This report has been drawn on the basis of the claims,
page(s) 54-55, 57-60 and 62-66, as originally filed.
page(s) NONE, as amended under Article 19.
page(s) NONE, filed with the demand.
and additional amendments:
Pages 56, 61 and 67, filed with the letter of 08 January 2001.

This report has been drawn on the basis of the drawings,
page(s) 1-5, as originally filed.
page(s) NONE, filed with the demand.
and additional amendments:
NONE

This report has been drawn on the basis of the sequence listing part of the description:
page(s) NONE, as originally filed.
pages(s) NONE, filed with the demand.
and additional amendments:
NONE

V. 1. REASONED STATEMENTS:

The report as to Novelty was positive (YES) with respect to claims 1-29,31-37,46,53-64,70,72-75,77-79,81,83-87,89-96.
The report as to Novelty was negative (NO) with respect to claims 30,45,47-52,68-69,71,76,80,82,88,139-141.
The report as to Inventive Step was positive (YES) with respect to claims 38-44,65-67,97-138.
The report as to Inventive Step was negative (NO) with respect to claims 1-37,45-64,68-96,139-141.
The report as to Industrial Applicability was positive (YES) with respect to claims 1-141.
The report as to Industrial Applicability was negative (NO) with respect to claims NONE.

V. 2. REASONED STATEMENTS - CITATIONS AND EXPLANATIONS (Continued):

Claims 30 and 68-69 lack novelty under PCT Article 33(2) as being anticipated by Allen(US Pat. No: 5,815,020). Applicant's amendment of claim 30 to have one component unrelated to interfacing with a smart card is insufficient to invalidate its fundamental communication operation as anticipated by Allen. Accordingly claim 141 which depends upon 30 lacks novelty also.

As per claim 30 Allen discloses a method of interfacing a smart card and an electronic device comprising providing a smart card, providing an electronic device including at least one standard component which component is not designed for digital communications, and driving said standard component to transmit or receive a digitally encoded signal between said electronic device and said smart card(Fig 2)

As per claim 68 Allen discloses a method of powering a smart card comprising: transmitting ultrasonic waves to a smart card; receiving said waves by the smart card converting said waves by said smart card into energy, and utilizing said energy by the smart card for powering processing of data(Fig 2).Allen discloses powering said card as addressed in applicant's objections, thus claim 68 and dependent claim 69 lack novelty.

As per claim 69, Allen discloses that the waves encode said data(Fig 2).

Claims 31-37 and 70 lack an inventive step under PCT Article 33(3) as being obvious over Allen(US Pat. No: 5,815,020). With respect to applicant's objections, with respect to claims 32 and 33, Allen does indeed point out a low frequency circuit in his disclosure; furthermore, claims 32 and 33 are dependent upon claim 30 previously shown to lack

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

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novelty. Claim 31 is also dependent upon 30 and consequently lacks novelty also.

As per claim 31, the limitation of a standard component comprising a speaker is an obvious design variation.

As per claims 32-33, the limitation of the signal comprising a low frequency RF signal or a low frequency ultrasonic signal are obvious design variations.

As per claim 34, Allen discloses the electronic device comprising a computer(Fig 1).

As per claim 35, the limitation of the computer forwarding a signal to a computer peripheral coupled to the computer would have been obvious in order to interface with the peripheral.

As per claims 36-37, the limitation of either a two-way digital or a one-way link between the smart card and the computer is an obvious design variation.

As per claim 70, Allen does not explicitly disclose that transmission occurs in the form of transmitting from a computer speaker. This is an obvious design choice so that it would have been obvious to one skilled in the art to do so.

Claims 45 and 47-51 lack novelty under PCT Article 33(2) as being anticipated by Takahashi(US 4,961,229).

As per claim 45 Takahashi discloses a smart card comprising: a memory, a text-to-speech converter for converting text from said memory into speech sounds and an external communication link for communicating information to or from said memory(cols 1-2). With respect to claim 46, Takahashi teaches a text-to-speech converter capable of storing information and changing it to speech, as taught.

As per claim 47, Takahashi discloses a smart card wherein said communication link comprises an acoustic communication link and wherein said speech sounds are outputted using said acoustic link(cols 1-2).

As per claim 48, Takahashi discloses a smart card comprising circuitry for receiving indications over said link and converting said indications into text(cols 1-2).

As per claim 49 Takahashi discloses a smart card comprising a speech recognition circuit, for entering information into said smart card(cols 1-2). Takahashi's speech recognition circuit allows for conversion from text to speech. Such a process is reversible and hence claim 49 and 50 are not novel.

As per claim 50 Takahashi discloses a smart card comprising a memory, a speech input circuit for entering information into said memory and an external communication link for communicating information to or from said memory(cols 1-2).

As per claim 51 Takahashi discloses a smart card wherein said communication link comprises an acoustic communication link and wherein said speech sounds are inputted using said acoustic link(cols 1-2). With respect to applicant's statement for claim 51, Takahashi teaches a speech recognition circuit. With respect to the transfer function of such a circuit, reversibility is implied, enabling a design modification to meet the limitations of claim 51.

Claim 46 lacks an inventive step under PCT Article 33(3) as being obvious over Takahashi(US Pat. No: 4,961,229).

As per claim 46, the EMV form standards are well known and it would thus be obvious to configure the device to meet them.

Claim 52 lacks novelty under PCT Article 33(2) as being anticipated by Gullman et al(US Pat. No: 5,280,527).

As per claim 52 Gullman discloses a smart card comprising a memory, an external communication link for communicating information to and from said memory and a biometric data acquisition circuit for acquiring biometric data wherein said circuit shares and input transducer with said communication link(Fig 2). Gullman teaches in Fig 2 a biometric data unit utilizing an input transducer the output of which goes to a processor. This unit shares the input transducer with the communication link to the processor. Claim 52 lacks novelty.

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(To be used when the space in any of the preceding boxes is not sufficient)

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Claims 53-64 lack an inventive step under PCT 33(3) as being obvious over Gullman(US 5,280,527).

As per claim 53, an acoustic communication link is an obvious design variation.

As per claims 54-55 each of the biometric data acquisition circuit comprising a voice input circuit or motion determination circuit are obvious design variations.

As per claims 56-57 each of the biometric data comprising either motion of the smart card in the form of a gesture or in the form of handwriting are obvious design variations

As per claim 58, Gullman discloses a processor for evaluating biometric data against a sample of biometric data(Fig 2).

As per claim 59 Gullman discloses that the biometric data is stored in the memory(Fig 2).

As per claim 60 Gullman discloses that the acquired biometric data is stored in memory(Fig 2).

As per claim 61, Gullman does not disclose the motion of a smart card by a person, detecting said motion using at least a circuit on the card, and analyzing the motion to obtain a biometric signature of the person. However, it would have been obvious to one of ordinary skill in the art to perform the above to authenticate the holder of the card, because in Gullman access is granted based in part on the biometric qualities of the individual. Thus the principles taught in Gullman can be applied to claim 61. Claim 61 lacks novelty. Thus 62-64 do too as they are dependent from independent claim 61.

As per claim 62 Gullman does not disclose detecting said motion using an inertial motion detector in said card. However it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Gullman to do the above to authenticate the holder of the card.

As per claim 63, Gullman does not disclose detecting said motion using an acoustic distance measurement, which measurement uses an acoustic transponder of said card. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Gullman to do the above to authenticate the holder of the card.

Claims 71,80 and 82 lack novelty under PCT Article 33(2) as being anticipated by Anegawa(US Pat.No: 4,978,840).

As per claim 71, Anegawa discloses a method of powering the smart card, comprising:transmitting light waves to a smart card, receiving said waves by the smart card, converting said waves by said smart card into energy, and utilizing energy by said smart card for powering the processing of data, wherein said waves encode said data(Fig 5).The utilization of the same waves for power and data is not material it is the source of energy and the conversion of one source to another that is key in the process. Claim 71 lacks novelty.

As per claim 80, Anegawa discloses a method of charging a smart card, comprising receiving by said smart card of ambient RF radiation, converting said received radiation into stored energy and storing said energy by said smart card for subsequent powering of the operation of the smart card(Fig 5).Utilization of energy at different frequencies in the electromagnetic regime is not material in the powering of the smart card as the electromagnetic waves are still the source of the energy that is the means for powering the smart card operation. Claim 80 lacks novelty.

As per claim 82, Anegawa discloses a smart card comprising an inertial power source, a memory and an external communication link powered by said inertial source to transmit or receive information for said memory(Fig 5). Use of an inertial power source is an obvious modification of an energy supply for the link. Claim 82 lacks novelty.

Claims 72-75, 81 and 83-87 lack an inventive step under PCT Article 33(3) as being obvious over Anegawa(US Pat. No: 4,978,840).

As per claims 72-73, the choice of either an ultrasonic link or an IR link are obvious design variations.

As per claims 74-75, the choice of whether or not the transmitting is timed to synchronize or not to synchronize with the

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(To be used when the space in any of the preceding boxes is not sufficient)

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processing is an obvious design variation. Furthermore, since claims 72-75 depend upon independent claim 71 which lacks novelty, these claims do also.

As per claim 81 Aneawa does not disclose that the ambient radiation comprises normally emitted radiation from a cellular telephone. However it would have been obvious to use the radiation from a cellular phone due to the ready accessibility of these devices. Claim 81 lacks novelty.

As per claim 83, Aneawa does not disclose that the internal power source comprises a storage battery which is recharged by said inertial power source. It would have been obvious to one of ordinary skill in the art to use such recharging to extend the utility of the device. Claim 83 is dependent upon claim 82 which lacks novelty. Thus claim 83 lacks novelty.

Claims 84 and 86-87 differ from claim 82 by using a different power source. However, such a choice is just merely an obvious design variation. The principle of the utilization of a power source is the same whether it be a force transducer based input or an optical power input. There is no novelty in claim 84.

As per claim 85, the limitation of the storage battery which is recharged by the power source would have been obvious to extend the utility of the device.

Claims 76 and 88 lack novelty under PCT Article 33(2) as being anticipated by Jachimowicz et al(US Pat. No: 5,763,862).

As per claim 76, Jachimowicz discloses a method of interaction between a card and a computer, comprising: inserting said card into a drive for removable media other than said card of said computer, and transmitting information between said card and said drive(Figs 12 and 13). For a drive being as removable media drive for other types of removable media this is an extension of the drive utilized. Claim 76 lacks novelty.

As per claim 88, Jachimowicz discloses an optical smart card having an optical data input circuit, a wireless output link and a memory for storing information from said input and outputting via said output link(Figs 12 and 13). Jachimowicz specifically discloses electrical data input and wireless output. The disclosure in claim 88 is an obvious design variation.

Claims 77-79 and 89-96 lack an inventive step under PCT Article 33(3) as being obvious over Jachimowicz(US 5,763,862).

As per claims 77-78 both diskette and optical disk drives are obvious design variations.

As per claim 79 transmitting power from the computer to the smart card using a said drive would have been obvious to power the card.

As per claims 89-91 the recited optical input, whether it be scalar, two-dimensional are all obvious design variations.

As per claim 92 the limitation of an optical power input circuit which converts ambient light into stored energy would have been obvious to power the device.

As per claim 93, the limitation of the optical power input and the optical data input sharing a common optical sensor would have been obvious to reduce the complexity of the device.

As per claims 94-96 the recited acoustic, IR and RF links are all obvious design variations.

Claims 38-44 meet the criteria set out in PCT Article 33(2)-(4) because the prior art does not teach or fairly suggest an acoustic smart card with the limitations recited in claim 38.

Claims 65-67 meet the criteria set out in PCT Article 33(2)-(4) because the prior art does not teach or fairly suggest a smart card with the limitations recited in claim 65.

Claims 97-138 meet the criteria set out in PCT Article 32(2)-(4) because the prior art does not teach or suggest a smart card with the limitations recited in claims 97,105,114,124, and 130.

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As per claims 139-141, Allen discloses a smart card comprising a memory for storing information; at least one transmitting or receiving antenna, and a low frequency circuit for handling information associated with said antenna and memory(Fig 2).Allen does not disclose that the information is modulated at a modulation frequency of between 5Khz and 100khz. However, since the modulation frequency is in the low frequency regime this is an obvious design application.

----- NEW CITATIONS -----

NONE

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(40)

22. A smart card according to any of claims 1-11, wherein said modulation frequency is over 17 kHz.

5 23. A smart card according to any of claims 1-11, wherein said at least one antenna comprises a piezoelectric antenna.

24. A smart card according to any of claims 1-11, comprising a high-frequency circuit for modulating information at higher than 200 kHz.

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25. A smart card according to any of claims 1-11, comprising a high-frequency circuit for modulating information at higher than 1 MHz.

15 26. A smart card according to claim 24, wherein said high frequency modulated information is transmitted using an RF circuit.

27. A smart card according to claim 24, wherein said high frequency modulated information is received using an RF circuit.

20 28. A smart card according to any of claims 1-11, wherein said smart card implements a two-way communication protocol.

29. A smart card according to claim 28, wherein said protocol comprises an error correction protocol.

25

30. A method of interfacing a smart-card and an electronic device, comprising:
providing a smart card;
providing an electronic device including at least one standard component having a function unrelated to interfacing with a smart card; and
30 driving said standard component to transmit or receive a digitally encoded signal between said electronic device and said smart card.

31. A method according to claim 30, wherein said standard component comprises a speaker.

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70. A method according to claim 68 or claim 69, wherein transmitting comprises transmitting from a computer speaker.

71. A method of powering a smart card, comprising:
5 transmitting light waves to a smart card;
receiving said waves by the smart card;
converting said waves by said smart card into energy; and
utilizing said energy by said smart card, for powering the processing of data,
wherein said waves encode said data.

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72. A method according to claim 71, comprising transmitting a result of said processing from said card using an ultrasonic link on said smart card.

73. A method according to claim 71, comprising transmitting a result of said processing
15 from said card using an IR link on said smart card.

74. A method according to any of claims 68-69 or 71-73, wherein said transmitting is timed to synchronize with said processing.

20 75. A method according to any of claims 68-69 or 71-73, wherein said transmitting is not synchronized with said processing.

76. A method of interaction between a card and a computer, comprising:
inserting said card into a drive of said computer, which drive is for removable media
25 other than said card; and
transmitting information between said card and said drive.

77. A method according to claim 76, wherein said drive comprises a diskette drive.

30 78. A method according to claim 76, wherein said drive comprises an optical disk drive.

79. A method according to any of claims 76-78, comprising transmitting power from said computer to said smart card using a said drive.

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132. A smart card according to claim 130, wherein said smart card locks in said second state.

5 133. A smart card according to claim 130, wherein said pattern display changes to said second state over time unless otherwise activated.

134. A smart card according to claim 130, comprising circuitry for switching states of said pattern display to said second state.

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135. A smart card according to claim 134, wherein said circuitry comprises a delay circuit for delaying said changing for a period of time.

15 136. A smart card according to claim 134, comprising circuitry for receiving a command over said link to switch states.

137. A smart card according to claim 136, wherein said command is verified using a digital signing or encryption.

20 138. A smart card according to any of claims 130-136, wherein said invalid-indicating pattern in said second state is perceptible by a human viewer.

139. A smart card according to any of claims 1-11, wherein said antenna radiates or receives far-field radiation.

25

140. A smart card according to any of claims 1-11, wherein said card transmits information without a carrier wave.

30 141. A smart card according to any of claims 30-35, wherein said data is encoded as a stream of bits.